09-12-88

SEPT/88

ZX-Appeal

vancouver sinclair users group

next meeting:

KILLARNY COMMUNITY CENTRE
6260 KILLARNY STREET
VANCOUVER

FRIDAY;7:00PM

Sept. 9/88

ZXAppeal is a monthly newsletter put out by the Vancouver Sinclair Users Group. For more information on the group and ZXAppeal see the backcover.

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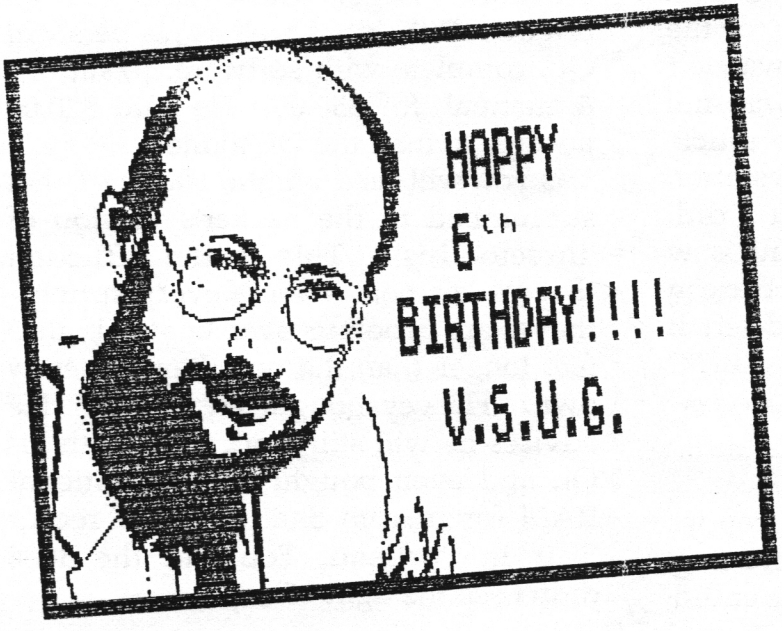


THIS ISSUE.....

Summer is over and now it's back to the grind. Hope you had a good vacation. The cooler weather should come shortly and with it more time spent indoors. And that means more time spent computing!

Not much in the way of submissions this month other than a couple of things from Harvey: another 'Playing with', and his thoughts on the recent 'Do' in Portland. (I'm still not sure if he liked it or not.) I"ve managed to steal an item you might find of interest: a recent write-up on Clive in a new 'PC' type mag. This one is a little more positive in its viewpoint. Part II of the 'Cassette Connection'- continued from Part I last month, is reprinted from SyncWare News with Fred's permission. And some other stuff I hope you'll find of interest.

By the way, the April issue included an article by Harvey on Modapters for the QL. Well, the circuit diagram was left out by mistake. This error was not noticed by any reader until the article was reprinted in another newsletter. They didn't notice it either but I did. When I read their newsletter and saw the diagram missing, I checked back in the April issue to find that I'd left it out also! Does anyone read this stuff???

****

Bits & Pieces.....

..."Keeps on Tickin"...another report has come in saying ZX81s are still being used to manufacture dedicated industrial controllers. This time it is a Swiss firm - adding an LCD display and I/O interface to the "door-stop".

...the paper library now has a copy of each of the Sam's books "ComputerFacts" technical and repair manual for both the 1000 and the 2068. If you need to know any of the 'specs' of either machine, these publications will have it.

...the PCCFA will be holding the next Computer Fair and Swap Meet/Flea market on Saturday, October 1. The group will again be holding down a couple of tables to show-off our machines and let the world know we're still around. All members wanting to 'man' the tables can put their name on the list at the Sept meeting. Everyone should try to drop in to this Fair as some great bargains can be found.

...your Editor is now the owner of the QL previously owned by the man who oversaw the development of the QL for Sinclair. Nigel Searle sold me an original ZX80 kit as well as his personal QL, complete with software, p/supply, & manual, for $50.00. He paid $20.00 postage to mail the QL to me!

...as you will read within, Harvey T. has succumbed to the hacker's version of 'threefootitis'. This is the affliction that strikes boat owners every spring - they start drooling over boats about 3 feet longer than the one they presently own. Harvey bought an Amiga. He advises he will still work/play with his QL and even bought some additional RAM for it from Sharp's at the recent 'Fair in Portland. Too bad the 3086 didn't see the light of day.

...next meeting

A GREAT NORTHWEST SINCLAIR FEST TRIP REPORT

-by Harvey Taylor

I wasn't going to go. I had made up my mind I was too disappointed last year, it was too far away, I didn't want to go to the states again. Then at the last minute Wilf phoned & bang. In an instant, I changed my mind.

Well, I have good news & I have bad news. The good news is that only the fanatics are left & the bad news is that only the fanatics are left. You could characterize the fest as more of a wake & catch one of the predominant feelings there. Some dry statistics tell the tale... Expected attendees 300-600. Actual attendees 100-150. There were a lot of "Why aren't there more users, more club members --- Where did everybody go?" questions. And the answers are fairly clear, if you care to look. They went back to golf/cars/girls/the latest craze or they moved on to Mac/Amiga/ST/IBM/robots/ or whatever non-orphan.

A group like a computer club exists in one sense as a group self-education process. At the beginning, we were all lost & maybe somebody in the group had come across your problem & knew how to fix it or avoid it. We all taught each other our neat tricks. Some passed through the group quickly. Others stuck around and made friends. There are those few who really are attracted by design elegance, by facing the question --- just how much can you pack into 8K of ROM. Fanatics.

As for the Festival itself...there were a few high points - the evening free-for-all when somebody asked how many people were seriously interested in the Z88 & two dealers held up their hands. Also during the free-for-all, there was a spark of life when plans were made to try to interest the SNUG (Sinclair National User's Group) [Americans have no inkling why they might want to call this proposed organization a North American User's Group] group in a BBS based continental newsletter.

The other interesting part of the Fest for me was just in the people I met. It is a treat to meet & talk with other knowledgeable QL'ers -- to find out what other people are developing & wrestling with. These personal contacts are the ultimate rationale for such Festivals.

PLAYING WITH ELECTRICITY
- Harvey Taylor

Tucked away in a description of the QL hardware in the Technical Guide is mention of the fact that bit 7 of the Display Control Register "can be used to switch the base of screen memory from $20000 to $28000". Hmmm, interesting I thought and went on to more pressing concerns.

Recently, I went back to investigate the dual screen display. There is a discussion & program dealing with it in Adrian Dickens "QL Advanced User Guide". The news is it is real; but flawed. First a quick overview of the QL memory map.

K	HEX	USE
256K	00040000	Top of On Board RAM
192K	00030000	Top of Screen1
		Top of Common Heap
		Base of Common Heap
	00028480	Top of Sys_Var
160K	00028000	System Variables & Base of Screen1
	00027FFF	Top of Screen0
128K	00020000	Base of Screen0

The immediate problem with the second Screen is the fact that the System Variables are locked into $28000 which is the base of Screen1. This means that if you simply flick the bit which controls the base of the display, you will get a bunch of garbage on the top of your screen. The garbage is the video representation of the System Variables.

You can take a look at this effect with the following short Superbasic Procedure.

```
100 REMark switch in Screen 2
110 :
120 DEFine PROCedure SWITCH
130   SV_MCSTA=163892 : REMark $28034
135   DC_REG  =98403  : REMark $18063
140   DCR_STATUS=PEEK(SV_MCSTA)
150   DCR_STATUS=DCR_STATUS ^^ 128: REMark toggle bit 7
160   POKE SV_MCSTA,DCR_STATUS    : REMark tell Sys_Var
170   POKE DC_REG,DCR_STATUS      : REMark tell hardware
180 END DEFine SWITCH
190 :
```

This is interesting, but useless. To make a useable display, one has to be a little trickier. One of the neat things about the QL is that QDOS is extensible. In particular, one can link in tasks for the QL to perform after each interrupt. There is a Level 2 Interrupt (called a Frame Interrupt) on the QL every 1/60 second; which is related to the Vertical Sync signal.

What we need to do is Link in a short Task which checks what screen we are displaying; then if we are displaying Screen0, do nothing, while if we are displaying Screen1, wait until the display has passed the 5K or so of System Variables then switch in Screen1.

The assembly language code to do this is listed below in the file DualScr_asm. Once you have this code installed, you will run into the next problem. There is no support in QDOS for writing to Screen1. It is evident that in the development of the QL, this was a matter of some debate, because in the SCR/CON Channel Definition Block (CD_Blk), there is an entry (SD_SCRB) Base address of screen. The unfortunate fact is that the SCR/CON device driver does not use this variable. Instead the base address ($20000) is hardcoded into the driver. This was no doubt done in concert with the decision to tie the System_Variables at $28000.

As the QL is at present, if the driver did use the CD_Blk variable, clearing the screen would erase all the System_Variables; so it is just as well that it is not implemented!

What's to do? It seemed to me that the simplest method to use would be to simply copy Screen0 into the useable part of Screen1. The Superbasic extension SCOPY performs this task. I wanted a Clear Screen1 capability as well, so I added the PROCedure SCLR. This procedure expects one parameter which is used to colour Screen1. The video ram of the QL display is arranged thus:

```
Mode 4
Even Byte  : Odd Byte
76543210   76543210   - Bits
GGGGGGGG : RRRRRRRR          G - Green
                             R - Red
Mode 8                       F - Flash
Even Byte  : Odd Byte        B - Blue
76543210   76543210   - Bits
GFGFGFGF : RBRBRBRB
```

Passing SCLR the parameter 0, will paint the screen black. You can play with other parameters to see the effect of setting various bits. If you use 65280 for Green, the interpreter returns an overflow error; but -256 works fine. 255 paints the screen red.

The procedure SCR0 turns off the Auto-Toggle and gives you the default display, ie. Screen0. The procedure SCR1 turns off the Auto-Toggle and gives you Screen1. The procedure SCRA turns on the Auto-Toggle; ie. switch between the two screen using <CTRL><F5>.

The function SCRNUM tells you which screen is currently being displayed, 0 or 1. The function SWHERE tell you the base of the Common Heap Memory reserved by the initialization code.

There are some proviso's with this code. It should be initialized fom a boot: in particular before a directory of a second device is done. This is because we want Screen1 to begin as close to the Base of the Common Heap as possible. If you do a directory of another device before initializing; QDOS reserves some common heap as a Channel Definition Block and a Physical Definition Block. This will show up as a white band similar to what SWITCH produces.

Related to this situation is the value of the Timeout value used to wait before switching Screen1 on. See the comments in the _asm file.

The other proviso, is that the dividing line where Screen1 switches in is not stable. The easiest way to handle this problem, is to put a black border over the region similar to the PROCedure SDEMO below.

The first SBasic program below creates a file DSCR_ext which is used by the second the SBasic program SDEMO.

>eof

```
100 REMark PLAY WITH SCREEN UTIL
110 :
120 LAYOUT
130 INIT
140 DEMO
150 STOP
160 :
170 DEFine PROCedure DEMO
180   PAPER 0: CLS
190   PICTURE
200   PAPER 4
210   AT 0,0: PRINT 'SCREEN 1'
220   SCOPY 230   SCR1
240   CLS
250   SCR0
260   SCRA
270   LIST TO 260
280   AT 0,0: PRINT 'SCREEN 0'
290   PRINT#0,'USE <CTRL><F5> TO TOGGLE SCREENS'
300 END DEFine DEMO
310 :
320 DEFine PROCedure PICTURE
330   FOR M=0 TO PI STEP .25: FOR N=0 TO 105 STEP 15 : INK (RND(2,6)):
      CIRCLE 200,128,N,.5,M: END FOR N : END FOR M
340   INK 7
350 END DEFine PICTURE
360 :
370 DEFine PROCedure INIT
380   nam$='SCR2_ext'
390   dev$='flp1_'
400   LBYTES dev$ & nam$,RESPR(512)
410   PRINT'Loaded'
420   CALL RESPR(0)
430   PRINT'Initialized'
440 END DEFine INIT
450 :
460 DEFine PROCedure  LAYOUT
470   WINDOW#0,512,64,0,0   : BORDER #0,10,0
480   WINDOW#1,512,192,0,64 : BORDER #1,10,0
490   WINDOW#2,512,192,0,64 : BORDER #2,10,0
500   PAPER#2,4: INK#2,0
510   PAPER#1,4: INK#1,7
520   PAPER#0,2: INK#0,7
530   SCALE 256,0,0: MODE 4
540 END DEFine LAYOUT
```

```
100 REMark Create SCR2_EXT file
110 :
120 DLOAD
130 DSAVE
140 STOP
150 :
160 DEFine PROCedure DSAVE
170   REMark Save memory to file
180   nam$='SCR2_ext'
190   dev$='flp1_'
200   SBYTES dev$ & nam$,RESPR(0),408
210 END DEFine DSAVE
220 :
230 DEFine PROCedure DLOAD
240   REMark writes DATA to memory & inits PROC & FUNC
250   addr=RESPR(512)
260   RESTORE 400
270    REPeat loop
280      READ x: IF x=-1: EXIT loop
290      POKE addr,x
300      addr=addr+1
310    END REPeat loop
320   PRINT#0,'Loaded '
330   CALL RESPR(0)
340   PRINT#0,'Initialized'
350 END DEFine DLOAD
360 :
370 REMark SCR2_ext code for 2 screens utility
380 REMark SCLR,SCOPY,SCR0,SCR1,SCRA; SCRNUM,SWHERE
390 REMark
400 DATA 67,250,0,70,52,120,1,16
410 DATA 78,146,116,0,34,60,0,3
420 DATA 0,0,6
5,249,0,2,128,0
430 DATA 32,40,0,8,65,240,8,0
440 DATA 146,136,47,1,112,24,78,65
450 DATA 34,31,74,128,102,24,67,250
460 DATA 1,16,34,136,67,250,1,24
470 DATA 65,250,1,12,112,28,33,73
480 DATA 0,4,78,65,112,0,78,117
490 DATA 0,5,0,144,4,83,67,82
500 DATA 65,0,0,144,4,83,67,82
510 DATA 48,0,0,144,4,83,67,82
520 DATA 49,0,0,88,5,83,67,79
530 DATA 80,89,0,34,4,83,67,76
540 DATA 82,0,0,0,0,2,0,174
550 DATA 6,83,67,82,78,85,77,0
560 DATA 0,116,6,83,87,72,69,82
570 DATA 69,0,0,0,52,120,1,16
580 DATA 78,146,74,128,102,8,12,67
590 DATA 0,1,103,4,112,241,78,117
600 DATA 48,54,152,0,65,250,0,154
610 DATA 32,80,67,249,0,3,0,0
620 DATA 48,192,177,201,101,250,96,0
630 DATA 0,132,67,249,0,3,0,0
640 DATA 32,9,65,250,0,124,32,80
```

```
650 DATA 144,136,83,64,69,249,0,2
660 DATA 128,0,19,34,81,200,255,252
670 DATA 96,98,67,250,0,104,80,209
680 DATA 96,90,67,250,0,96,66,81
690 DATA 96,82,67,250,0,88,50,188
700 DATA 0,255,96,72,67,250,0,74
710 DATA 34,17,34,110,0,88,93,73
720 DATA 45,73,0,88,66,118,152,0
730 DATA 74,129,103,16,52,60,8,32
740 DATA 83,66,227,129,104,250,226,145
750 DATA 61,130,152,0,45,129,152,2
760 DATA 120,2,96,24,114,1,194,58
770 DATA 0,29,34,110,0,88,85,73
780 DATA 45,73,0,88,61,129,152,0
790 DATA 56,60,0,3,112,0,78,117
800 DATA 0,0,0,0,0,0,0,0
810 DATA 0,0,0,0,0,0,18,46
820 DATA 0,52,19,193,0,1,128,99
830 DATA 74,43,0,7,103,36,74,174
840 DATA 0,152,102,50,74,174,0,156
850 DATA 102,44,74,46,0,238,102,38
860 DATA 48,60,6,44,81,200,255,254
870 DATA 8,193,0,7,19,193,0,1
880 DATA 128,99,74,43,0,6,103,14
890 DATA 74,46,0,51,103,8,81,238
900 DATA 0,51,70,43,0,7,78,117,-1
910 :
```

Disk Droppings
by
Greg Lloyd

The latest offering from Larken Electronics is a 256K RAM-DISK for the 2068. It gives the owner up to 256K of Non-Volatile Static Ram (SRAM). This is battery backed storage of up to 256K of programs and data. It can be used in combination with the DSK 400 disk interface and 4 disks or on its own with the LKDOS cartridge. It will also AUTOSTART to load and run a program on power up.

The board used for the RAM-DISK is roughly the size of the DSK 400 - 4 x 2 inches and piggy-backs to the your disk interface or the expansion port on the 2068. It is fully through ported so other periferals can be hung behind. My 2050 modem and 2040 printer worked just fine. The order of installation does not seem to matter. I used the DSK 400 interface then the RAM-DISK personally.

To default to the RAM-DISK you just have to press the [J] key and [ENTER] on power up. If you have saved a startup menu or any other application it loads and runs immediately. The time involved is about one second. If you have used the T/S Command Cartridge System to run Crazy Bugs or States and Capitals you will see the advantage over tape and disk. The added feature is that you can save and change data on the RAM-DISK and it will still be there after you turn the machine off. This all happens in a blink of an eye. No whirring, clicking, popping, grinding, crunching, gorching or glitching and no red leds flashing. You can also use the command PRINT #4: GOTO 4 if you are already powered up. The LKDOS software sees the RAM-DISK as the fifth possible drive. All in all, a new and most unusual experience. Larken Electronics has not only brought 2068 disk users a new standard of compatibility but now a new meaning to the phrase "Silent Service".

Sir Clive's latest creation the Z-88 (bearing the Cambridge Computer name and a huge price tag in my humble opinion), uses the same principal to store and operate. Solid state memory is certainly faster, more robust and has fewer moving parts than any disk system I have seen. I think it is the most sensible way to go, barring the resurrection of those beloved micro-drives. My system has 128K of SRAM on board. This gave me enough storage to be useful and no concern about making the mortgage payments.

The bare board unassembled and without memory is priced at $15. The assembled board without memory is available for $60. A LKDOS cartridge and software upgrade is necessary to run this option. The setup could be used as the only source of storage if desired. It does make a neat solution to those of you who wish not to go for a disk drive. All other functions are still available so you could save to tape for permanent storage and backup.

Larry Kenney the wizard behind the system, has developed a back-ground print spooler. This feature allows Tasword files to be printed while another program is running. This is another plus to the system, the creator is using and developing further enhancements to the machine. And you thought you had an orphan computer. Sorry to disappoint you.

SRAM chips needed for the RAM-DISK are 43256LP from NEC or 62256LP from other manufacturers. The latter are priced $26.40 (Can.) at Active Components. The speed of these should be 120 or 150 nanosecond. The LP stands for low power and unless you have an unlimited supply of batteries its recommended you use the LP version. Larken Electronics has some SRAM chips available for less and Computer Shopper has them advertised from $11 to $13 (U.S.) if you want to wait. Price is now volatile in the non-volatile memory market.

So if you have a DSK 400 from Larken and want to get the latest goody or if you don't have a disk and want some of the benefits, get in touch with your checkbook and order the RAM-DISK. I find it the best thing I ever did for my 2068 system. To quote from the movie, "I feel the need ...-the need for SPEED". You don't need to join the Navy or buy and F-14, get a RAM-DISK from Larken and go supersonic. GBL 880420.

Reprinted from the May/June issue of Sinc-Link - the N/L of the Toronto T/S Users Group

2068 CASSETTE CONNECTION

Part II: Loading Tips

In the last issue, I recommended removal of a couple capacitors in the SAVE circuitry of the TS2068. This provides a "brighter" save signal, which makes subsequent loading more reliable. This is all that is required to get many systems working "up to spec," and makes the use of "fast-load" routines possible, even practical. On further research, however, I found that there can still be problems with some systems involving the LOAD portion of the computer-to-tape interface. In this article, I'll discuss the load circuitry, and suggest a few minor changes that you can make to improve reliability if you're still having trouble.

Before I get on with this, I should mention that NOT ALL TS2068's ARE CREATED EQUAL. I had the opportunity to look at a 2068 recently acquired from Games To Learn By (GTLB), and found that the small capacitors directly across the MIC and EAR jacks on the underside of the board were absent on this unit. Also, the two series 1N4148 diodes CR25 and CR26 (discussed later) were bridged with a single identical unit. Furthermore, there are appreciable discrepancies between the Timex schematic and the actual hardware. For example, the SAVE circuit shows yet another capacitor across the MIC output (C72) which is not even marked on the board on either unit I've seen. There are also various other capacitors and wires floating around which look suspiciously like "tack-ons."

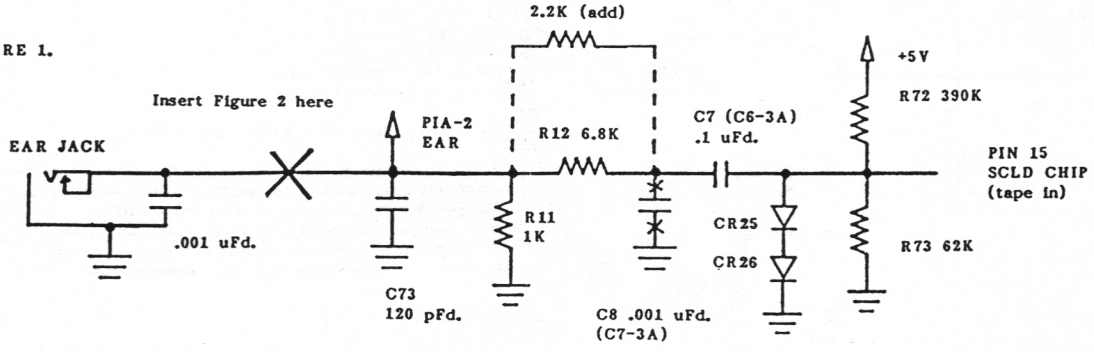
To complicate matters further, it appears that there are at least two discrete board patterns in existence, with different parts callouts for the same components. These alternate parts callouts are shown on the schematic in parentheses with a "-3A" suffix. For example, capacitors C7 and C8 in the LOAD circuitry (discussed later) are C6 and C7, respectively, in the "-3A" version. Both of the boards I've seen have a "-03D" suffix in the number under the "TIMEX 2000" legend and both corresponded with the "-3A" variation on the schematic, so presumably any board designated "-3A" or greater will follow the alternate part numbers on the schematic. The bottom line is that what you read here and elsewhere about the 2068 hardware may or may not jive exactly with your machine.

Now, let's see what we can do to make it easier to "get loaded" on the 2068. The applicable portion of the schematic is reproduced here in Figure 1. As in the case of the MIC jack, there is at least one capacitor (C73) directly across the EAR jack. Again, this (or these) were presumably included to help reduce radio and TV interference. It seems that Timex's philosophy was, "if some capacitors do some good, then more will do more good." Unlike the caps across the MIC port, however, the one or ones on the EAR jack have a negligible effect on the tape signal itself. This is because the impedance looking into the MIC input of the recorder is several magnitudes higher (typically about 50,000 ohms) than the impedance of the EAR output (around 10 ohms). As a result, there is nothing to be gained by removing these capacitors, so you might as well leave it in! Who knows, they might even help reduce interference slightly.

Looking further into the schematic, we find a resistor (R11, 1000 ohms) in parallel with the EAR jack as well. Again, this is so much greater than the output impedance of the tape recorder EAR jack that it has no significant effect on the tape signal. It was probably included to provide the DC return required by some recorders. After that is a little network consisting of two resistors R12 and R73, two caps C8 (C7-3A) and C7 (C6-3A), and two diodes (CR25 and CR26). This is essentially a "diode clamp" circuit, which shifts the signal from, say -3 to +3 volts, to about -4 to +1.2 volts. Also, it provides a low-frequency (LF) corner of about 230 Hz., and a high frequency (HF) corner near 23 kHz.

My reason for digging into this was that I sometimes couldn't get some tapes to load, even at maximum volume setting on my 6 volt TS2020 or Minisette IX's. A quick measurement showed that my line voltage was somewhat low, around 110 volts. My present home-sweet-home has long secondary power lines and electric heat; I found that some tapes would load ok with the heaters unplugged, but wouldn't "take" if the AC line voltage dropped below the rated 120 VAC. A colleague reported similar problems, especially when trying to use a fast-load program to speed up the tape processes. If you're having similar border-line sensitivity problems with tape loading, the following modification may quite possibly handle it.

FIGURE 1.



2068 LOAD Circuit Mods

1: Open the 2068 by removing the seven screws and disconnect the keyboard tail. (Thankfully, the KB tail on the 2068 is considerably more substantial than the ones on the ZX81/TS1000!)

2: Locate the 6800 ohm resistor, R12 (blue-grey-red-gold). This is about 1 cm. below and slightly to the left of the C10 capacitor you removed last issue. Bridge this resistor with a 2200 ohm, 1/4 watt unit (red-red-red-gold). This will make the mod easy to remove if it doesn't do the trick for you. Alternately, you may clip the 6800 ohm resistor and replace it with an 1800 ohm unit. This increases sensitivity, which in my case was enough to allow loading tapes that wouldn't quite "take" even at full blast. It also raises the LF corner, making the system yet more immune to low-frequency garbage.

3: I also removed capacitor C8 (C7-3A), even though doing so is not strictly necessary; the HF corner created by this cap is high enough to avoid trouble with the standard tape routines. However, it may conceivably get in the way if you later use VOTEM or other V-F (voltage to frequency) analog interfaces, or if you decide to experiment with fast-load routines. Although the 2068 (about 1500 baud)is a lot faster than the ZX81 (at about 300 baud), a good tape recorder will support even faster loading; up to about 3500 baud, or 440 bytes per second.

4: Reconnect the KB tail, and set the board back into the case. Test your modification. If you're satisfied that you now have enough sensitivity, screw the two case halves back together.

This will handle many loading problems. Aside from the comparatively low sensitivity of the 2068's load circuitry, there's not much for which it can be faulted. Unlike the ZX81, the SCLD custom chip apparently contains a comparator to square up the signal. As a result, adding a comparator or Schmidt-trigger conditioner probably won't have a noticeable effect. However, if you have a tape recorder with a 6 volt supply, chances are you might still have trouble with sensitivity. If so, here are a few options:

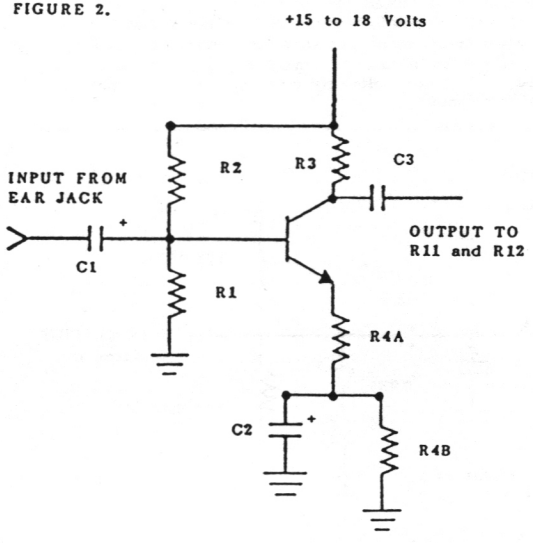
1: You can use VOTEM to help out, but you'll need to make a couple modifications. First, you'll have to supply a 9-volt power source such as a "transistor radio" type battery. Then, you'll have to connect the junction of R1 and R6 to +9V instead of +5, to give you a larger output swing. One caution, however; this modification may make it unusable with the ZX81/TS1000, as these prefer a lower tape signal voltage and some of them balk if it's too high.

2: Get a recorder with a higher supply voltage, e.g. 7.5 or 9 volt. This will allow a higher output swing.

3: Replace your present 6V AC adaptor with a 7.5 volt unit. These are available from Radio Shack and other sources. Try to get it on the condition that you can return it if it doesn't do the job. The slightly increased supply voltage will not harm well-designed recorders, but may be just enough to push you "over the hump." This option, if it works, is a lot cheaper than buying a new deck.

You might experiment with the number of diodes in the clamp. (Be warned! You are dealing directly with the SCLD chip. DON'T BLOW IT!-ed.) This affects the positive clamp level, at the rate of about .6 volts per diode. As mentioned above, the units from GTLB have the two diodes (CR25 and CR26) bridged with a single one. I tried this on mine, and found that it actually seemed to make matters worse. I also tried adding an extra diode in series, and found no noticeable change. You might also try increasing C8 (C7-3A) to, say 0.22 uF., especially if you reduced R12.

FIGURE 2.



PARTS LIST - 2068 LOAD AMP

C1-C3 - 1uFd., 16V tantalum
C2 - 47 uFd., 6V electrolytic
Q1 - general purpose audio transistor
2N3904, 2N4401, etc.
R1 - 910 Ohm 1/4 watt
R2 - 4700 Ohm, 1/4 watt
R3 - 470 Ohm, 1/4 watt
R4A - 100 Ohm, 1/4 watt
R4B - 33 Ohm, 1/4 watt

1"x 1" perfboard, wire, solder, sticky foam.

** For the convenience of those readers who would rather not scout around for parts, I (Fred Nachbaur) will wire up these boards, so that they will be ready for you to install, for $6.00 each (add $3.00 for speedy mail service). You'll then only have to cut one trace and make four wire connections.

...cont'd on pg.10

EUROTECH

stolen from the Sept/88 issue of PC Computing

By PETER WHITE

Mention a Professor Brainstorm–type eccentric British inventor and most people will conjure up something approaching bald, bespectacled Sir Clive Sinclair. Sir Clive is the designer of such great leaps forward as the first mass-produced electric car (a dismal flop), the flat $2^1/_2$-inch TV screen (he beat the Japanese into production with one), and a handful of market-shattering personal computers dubbed the ZX range, which are best known in Europe. The ZXs are now part of the ever-growing Amstrad empire, to which Sir Clive sold the venture.

Now ensconced among the academic spires of Cambridge, a sleepy train ride from London, Sir Clive probably got the idea for his latest foray into computers during painfully boring journeys to the capital.

Sir Clive's new brainchild is called the Cambridge Z88, and your first delightful impression as you take it from its box is that it is so light, someone must have forgotten to put the electronics inside. Immediately you might ask, "Where are the disk drives?" The fact is there are none, which starts a worrying series of thoughts along the lines of, "How am I going to get data to and from my desktop IBM-compatible PC?"

Eccentric British inventor Sir Clive Sinclair can add a notebook-sized computer to his list of accomplishments.

This gets to the heart of what the Z88 is really about—serious portability and "no tears" translation into PC-DOS machines, especially for WordStar users. Sir Clive clearly realized that the only thing computer users on the move need to do is input data in retrievable form.

So he's built a machine, based on the Zilog Z80 chip, that weighs less than 2 pounds and is about the size of a letter-sized paper pad. And on close inspection, you'll discover that the Z88's slightness doesn't compromise its functionality or compatibility.

Power is provided by four ordinary AA batteries, which in the machine's unexpanded version give you about 20 hours of working time. The display is an eight-line, 100-column supertwist LCD. The Z88 uses solid-state storage, with additional memory capacity provided by EPROM cartridges that fit into slots on the front of the machine.

Even when the screen display is switched off, everything held in the computer's memory is maintained—so long as the batteries have sufficient power. The screen displays a warning when the batteries are getting low, and an internal capacitor will keep the power going for up to six minutes while you're changing them. If you're using all three slots, however, you'll have only about 60 seconds to make the change.

Software is provided by an integrated package called Pipedream, which incorporates word processing, spreadsheet, and database capabilities. The machine also comes with pop-up utilities, including a clock, a calculator, a diary, an organizer, and an alarm reminder.

The standard Qwerty keyboard includes a few unusual dedicated keys—Index, Menu, Help, and a key marked with a square and another with a diamond—that are linked to features of the software.

Sir Clive's Z88 road machine—as light and small as a book, as wacky as its inventor.

Pressing the Index key returns the user to the main command level of the software and suspends the current operation. The Help key gives context-sensitive information about the current operation. The Menu key lets the user make selections regarding the current application; each menu selection is displayed with a shortcut equivalent that can be used in lieu of entering the full command.

The square and diamond keys are the prefix keystrokes for making shortcuts. The square introduces a shortcut for calling an application; the diamond precedes a shortcut for carrying out an operation.

The keyboard is covered by a rubber mat, which gives a dead feel to the keys but insulates the machine from contamination. It is virtually noiseless unless you activate the toggle to introduce an audible click for each keystroke.

Another unusual feature of Pipedream is its page-display map, which

...next page

cont'd from pg 8

The Final Solution

If you reduced the value of R12 as described above and still don't get enough sensitivity with your deck, and if the other "fixes" don't appeal to you, your best bet is to add a linear amplifier to boost the signal to the computer. Not much gain is needed, so a single-transistor "class A" stage is all you need. The circuit of Figure 2 is the answer that my ZX81 "CE AMP" program came up with. It has a voltage gain of about 3, and a P-P output swing of about 10 volts. Cost in parts is around $4, depending on how much of the circuit you have in your junk box. On my machine, it allows most tapes to load reliably with a volume setting anywhere between 4 and 10.

Wire it up on a 1"x1" piece of perf board, cut the trace to the EAR jack (underside of board) and connect the EAR jack to the input. Connect the output to the left side of R12. Get the +15 volts power for the circuit from the on-off switch (SW2), the leg closest to the front edge of the board. A good place to get the ground is from the grounding strap soldered to the top of the video-section enclosure. (If you want to get fancy, you can make use of the expansion port area. A1-top left is ground, A2 is the EAR jack and B3 is the +15V power.-ed.) The transistor can be virtually any NPN silicon type capable of at least 200 mW. dissipation and having a current gain (beta) of 50 or higher; e.g. 2N3904, 2N4401, etc. (Beware of the Radio Shack "2N3904 grab-bag." These are, in my experience, pretty lousy.)

Mount the board on top of the keyboard diodes (in front of the keyboard connector) using sticky-foam; watch for shorts. If you wish to use one of the little "Walkman"-type recorders with their 3V supplies, increase the gain to about 4 by making R1 = 1000 ohms, R4A = 75 ohms, R4B = 62 ohms. C1 and C3 should be 16V tantalum units, C2 may be an aluminum electrolytic rated 3V or up.

Load Amp for TS1000

You can use the one-transistor load amplifier circuit with the ZX81/TS1000/TS1500 by making the following changes in component values: *

R1 = 1000 ohms	R4B - not used	* As for the 2068,
R2 = 4700 ohms	C1 = 1 uF.	pre-wired boards
R3 = 160 ohms	C2 - not used	are available from
R4A = 33 ohms	C3 = 3.3 uF.	the author for $6

These changes are necessary because of the different supply voltage (9V instead of 15V) and input resistor value (220 ohms instead of 1000 ohms) as compared to the TS2068. Gain is set at about 3, and P-P voltage swing is just under 5 volts.

If you're using fast-load routines such as Z-XLR8, SDS, or Q-SAVE, it is recommended that you change capacitor C11 (located near the MIC jack on the ZX81 board) from 47 nF. to 20-22 nF (.02-.022 uF.). This increases the HF corner of the SAVE circuitry from about 3.5 kHz. to over 7 kHz. and provides a brighter signal. I did this simply by breaking the existing capacitor in half horizontally, using a pair of wire nips; works fine, but not a "guaranteed" procedure. After doing this mod, I found that I could run SDS (similar to Z-XLR8 at top speed) even without a pre-conditioner.

So there you have it. That should wrap it up, at least from a hardware standpoint. In a future issue we'll try to get you a flexible, variable fast-load routine. 'Till then, "good loads, fair weather!"

EUROTECH

appears on the right side of the screen and shows the layout of the whole page. It allows you to start formatting a document while you're still in transit. If you're downloading to WordStar, it can even retain print commands in a file after it's been dumped to DOS.

At the end of a journey, the downloading procedures are simple and reliable, expedited via a cable using a 9-pin RS-232 serial port and PC-Link II communications software. The software for the transfer resides in a 32K

The Z88's biggest attraction is its price. The basic machine costs only $549.

EPROM cartridge in one of four Z88 slots and on a floppy on the target machine, which controls the download.

Not the least of the Z88's attractions is its low price. The basic machine costs $549 in the United States, although for this you get only 32K of memory. Expansion cartridges are available in 32K, 128K, and 512K packs, but a 512K cartridge together with a PC link will almost double the initial price.

Sir Clive's Z88 will be distributed in the United States by Cambridge North American, a subsidiary of Diversified Foods, a $150-million-a-year Portland, Maine, grocery wholesaler turned computer distributor. Diversified took a warning shot across the bow from Amstrad as it lined up to use the Sinclair name, which went legally to Amstrad when Sir Clive sold the ZX line to the company. Diversified finally agreed to rechristen the venture.

Cambridge North American hopes to be moving the Z88 through computer stores and major retail outlets offering various promotional discounts. To help the machine get off the ground in the U.S. market, the company has signed a letter of intent to acquire 51 percent of its first dealer, Executive Computers, a four-year-old laptop specialist in New York City that sells to 800 of the Fortune 2,000 companies. ◧

FILE: ZXTMTXT.DOC

Silicon Mtn. Computers
C-12, Mtn. Stn. Group Box
Nelson, BC V1L 2J3
Canada

November 1987

ZX-TERM*80 AND MEMOTEXT

This document details how you can "marry" the popular Memotext word-processor with our ZX-TERM*80 terminal program for the ZX81/TS1000 computers. It details how to up/download "raw" Memotext files, as well as how to upload text files created with Memotext in an ASCII format readable by any computer.

Transferring "raw" files is quite simple, and would be useful for sending entire sets of files to another ZX/TS user, either directly or via a BBS or other service. He could then view, edit, or print the files using Memotext. However, such raw files would not be readable by other computer users; useful if you want to maintain some degree of confidentiality. If you want your files to be formatted, perhaps justified, and readable by anyone, you will have to use the second approach (more complex, but not too difficult once you get the hang of it).

I suggest that you first experiment with the "raw data" approach, perhaps with the co-operation of another local ZX/TS user.

Regardless of which approach you use, the minimum hardware and software you need are as follows:

HARDWARE:

1: ZX81, TS1000 or TS1500 computer.
2: A suitable 48K or 64K RAM, with 8-16K region disabled.
3: Modem (Byte-Back, or preferably Westridge)
4: Suitable static memory in 8-16K, as SCRAM, modified
   "Hunter board", or "Delta Device".
5: M1* adaptor or modification.
6: Tape recorder or other mass-storage.
7: Printer and printer interface.

SOFTWARE:

Memotext, V3 (high memory version)
ZX-TERM*80

I no longer commercially supply Memotext V3. However, if you send $5 to cover tape, photocopying and shipping, I'll send you a copy on a "shareware" basis. After you get it, send whatever you think it's worth.

Silicon Mountain will of course supply the ZX-TERM*80 program, on either cassette or EPROM. Write for details.

TRANSFERRING "RAW" MEMOTEXT FILES

To UPLOAD a set of Memotext files in Sinclair/Memotext format, proceed as follows:

1: Set up your system.

2: LOAD Memotext V3, and configure it for your printer and interface. You

may optionally load the HELP1 file. Create or load your files in the usual way. If necessary, print them out to be sure they're as desired. (If the files to be transferred already exist, even if created using a different version, you may skip this step.) Once your files are as you want them, save to tape using SAF (save all files).

3: Use the QIT function to exit Memotext, then enter NEW.

4: LOAD ZT-TERM*80, and configure for your printer interface if desired. Relocate the program to 39024. After entering ZX-TERM*80, use ESCAPE (shift space) to return to BASIC.

5: Re-enter Memotext at the cold boot entry point (RAND USR 43851). Re-LOAD your prepared files using LAF (load all files).

6: Again QIT from Memotext. Do not use RUN, CLEAR or NEW!

7: Re-enter ZX-TERM*80 with RAND USR 42622. Get the other person on the line, and get ready to upload the files. When the other terminal is ready to receive, go to Xmodem with SHIFT 4. Press "U" for "upload." Then answer "V" for "variables." The upload will commence.

8: When the transfer is complete, press any key to return to the main loop and terminate the connection.

Downloading is very similar.

1: Set up your system.

2: LOAD Memotext V3, configure it for your printer, and optionally load the HELP1 file.

3: QIT from Memotext, enter NEW, and LOAD ZX-TERM*80.

4: Get on-line, and prepare to download the file. Use SHIFT 4 to go to Xmodem, followed by "D" for "download," and "V" for "variables."

5: When the download is complete, return to the main loop and terminate the connection. ESCAPE to BASIC, answering (N)o to "SAVE FILES?"

6: Re-enter Memotext at the warm boot (RAND USR 46555). You can now edit, view, or print the files just downloaded.

TRANSFERRING FILES IN ASCII FORMAT

Usually you will want to transfer your text as ASCII files, formatted and perhaps justified, in other words just as it would appear if you printed it out. We have to take a somewhat different tack to accomplish this. What we will essentially do is "fool" Memotext into thinking that it's sending the text file to the printer, when actually the translated and formatted file is being stored in "spare" memory. We will then use a short machine-code routine to transfer the finished file into ZX-TERM*80's DATA REM buffer, for uploading to the other terminal.

Going the other way, downloading an ASCII text file, is of course no problem for ZX-TERM*80. If you relocate your "input buffer" as described, you can then use the little "dump" routine installed at the original buffer location, to send the file to your printer.

Unfortunately, it isn't feasible to convert such an ASCII file into Memotext format. As a result, you won't be able to edit downloaded ASCII files. For

this reason, we will only discuss how to UPLOAD Memotext files in fully formatted ASCII.

You will normally only transfer one text file at a time, though you could string several short text files together into a single upload. Also, data files are not transferrable using this approach, unless their contents are referred to within the text file.

To upload a Memotext file, follow these steps. As mentioned, it might seem complicated at first; however, after some practise, you'll find it easier than it first appears.

1-4: Follow steps 1 through 4 as for "raw" uploads. If the files to be uploaded already exist on tape, you can omit steps 2 and 3.

5: After ZX-TERM*80 is installed, ESCAPE to BASIC and LOAD the original copy of Memotext. When asked for your interface type, answer "OTHER." Then enter the following hexcode sequence:

E52A32407723223240E1C9

This installs a new "printer driver" that sends the translated and formatted ASCII output to memory instead of the printer, starting at the location contained in SEED (more about that later).

6: When prompted for LF/CR options, answer "LF + CR." This is because most boards want to see both a linefeed and a carriage-return code at the end of every line. Don't bother loading the HELP1 file; it would be overwritten anyway.

7: After entering Memotext, load your file or files from tape (LTF or LAF). NOTE: the length of your file or files to be sent in a single upload should be less than around 12K. Remember, ZX-TERM*80's DATA REM buffer is limited to about 15K. In the process of translating, spaces are added (when justifying, indenting, etc.) and LF/CR codes are inserted after every line. As a result, the ASCII translation will typically be somewhat longer than the Memotext "source code."

HINT: set up your file for 40 or 80-column width, using (edit)W at the beginning, for the convenience of other ZX-TERM*80 users.

8: QIT to BASIC, and enter RAND 50872. This sets the starting address for the ASCII translation, and represents the first byte beyond Memotext's data area.

9: Re-enter Memotext at the warm boot (RAND USR 46555).

10: "Print" your text file to memory using PTF. Answer (C)ontinuous mode. Justify (Y)es or (N)o as desired. After a few seconds, the program will be back at the FUNCTION? prompt. Repeat for any other text files you wish to send in this upload.

11: QIT to BASIC. Do not enter NEW. Instead, PRINT PEEK 16434+256*PEEK 16435. This will give the ENDING address of your translated file. If this is a low number (below 50872), your text file(s) is/are too long; the "pointer" has wrapped around, and tried to print your file to the ROM. You have to edit them down and repeat the procedure if this happens. Otherwise you'll crash when you try to import the file into the DATA REM buffer!

12: Without entering any other commands, re-enter ZX-TERM*80 with RAND USR 42622. Get into the main loop, and initialize your DATA REM using SHIFT 8. ESCAPE back to BASIC using shift space, followed by (N)o in response to "SAVE DATA?".

13: Now comes the only tricky part. We have to enter a little machine-code routine to transfer the file from high memory, into the DATA REM. You have to enter the following commands:

```
LET A$="EMRND::LEN : GOSUB PIVAL  FAST  AT  LPRINT  ):RND  GOSUB  :.  GOSUB
??RNDTAN"

LET A$(21)=CHR$ 83
LET A$(22)=CHR$118
```

Entering the first command is the one that will seem laborious at first. So here's a step-by-step procedure for entering this strange-looking command. "sh"=SHIFT, "fn"= FUNCTION (shift ENTER), "gr"=GRAPHIC (shift 9), "DEL"=DELETE (shift 0)

CHAR:	KEYS USED
LET	L
A	A
$	sh U
=	sh L
"	sh P
E	E
M	M
RND	fn, T
:	gr, sh 1
:	S, gr
LEN	fn, K
:	gr, J, gr
GOSUB	sh 3, H, sh 5, DEL, sh 8
PI	fn, M
VAL	fn, J
FAST	sh F
AT	fn, C
LPRINT	sh S
)	sh 0
:	gr, sh H, gr
RND	fn, T
GOSUB	sh 3, H, sh5, DEL, sh 8
:	gr, K
.	.
GOSUB	sh 3, H, sh5, DEL, sh 8
?	?
?	?
RND	fn, T
TAN	fn, E
"	sh P
ENTER	

Enter PRINT A$. It should look as shown above. Now enter the other two commands listed above. Again PRINT A$; it should still look the same.

14: Now enter PRINT USR 32771. It should come back with 0. The file is now in your DATA REM buffer!

15: Re-enter ZX-TERM*80 with RAND USR 42622. Use VU DATA (shift 5) to verify that the file has, indeed been translated, formatted, and moved into the DATA REM.

16: Upload the file as usual. SHIFT 4 gets you into Xmodem. Answer (U)pload, then (P)rogram. And away it goes.

16: If you wish to save the translated file, truncated to its actual length, you can of course do so by escaping, then answering (Y)es to "SAVE DATA?".

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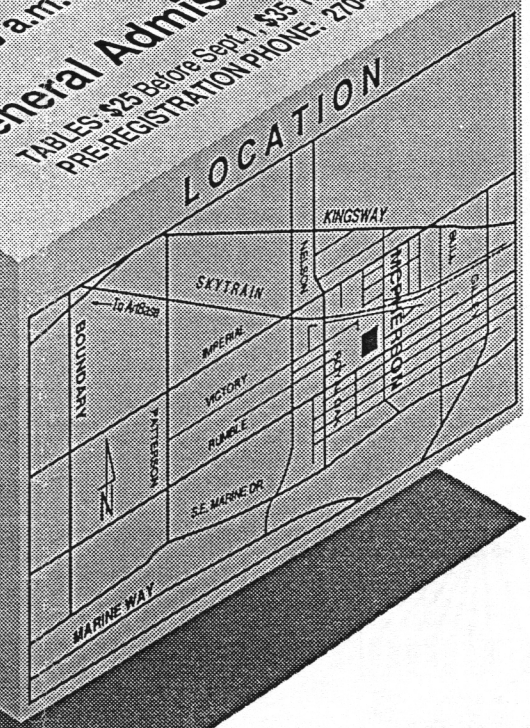

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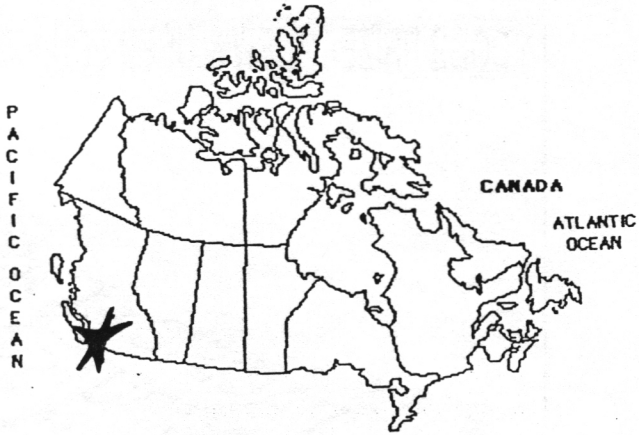

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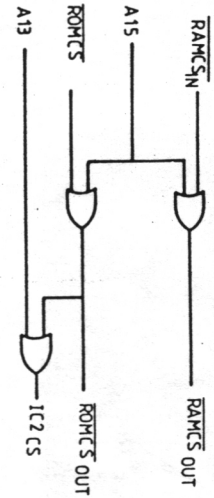

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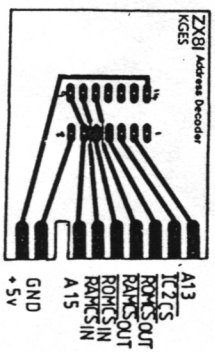

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